CLAIMS

What is claimed is:

1 1. A method for managing a memory system having a plurality of subsystems,
2 comprising the steps of:
3 upon accessing the subsystems for a piece of data used by a first process,
4 determining the access time to acquire the piece of data in the
5 memory system;
6 comparing the determined access time to a threshold; and
7 taking an action based on the results of the comparing step;
8 wherein accessing the subsystems is in a non-sequential order.

1 2. The method of claim 1 wherein data blocks containing the piece of data is placed
2 in the memory system based on information selected in one or a combination of:
3 a movement pattern of data in a data block,
4 a structure of the memory system, and
5 a cache-level architecture in the memory system.

1 3. The method of claim 1 further comprising the steps of:
2 using a memory table having entries pointing to data blocks storing data
3 for at least one subsystem; and
4 using the entries to locate the access data.

1 4. The method of claim 3 wherein the memory table working with a memory
2 manager managing the data blocks independent of an operating system working
3 with the memory system and independent of a processor working with the memory
4 system.

1 5.   The method of claim 1 further comprising the steps of:

2   using a memory table having entries pointing to data blocks storing data

3   for the memory system; and

4   the memory table using a physical address of a memory page

5   corresponding to the piece of access data to convert to a location

6   address corresponding to an entry pointing to the location of the

7   piece of access data.

1 6.   A method for managing a memory system, comprising the steps of:

2   upon accessing the memory system for a piece of data used by a first

3   process,

4   a processor working with the memory system continuing its

5   functions until it is stalled;

6   comparing the time taken to complete the memory access to a

7   threshold; and

8   if the time taken to complete the memory access is close to, equal

9   to, or greater than the threshold, then taking an action.

1 7.   The method of claim 6 wherein the action is selected in one or a combination of

2   postponing executing the first process and allowing executing a second

3   process;

4   causing the first process to be switched to a second process; and

5   causing a performance monitor on the memory system or on a system using

6   the memory subsystem.

1 8.   The method of claim 6 further comprising the step of polling a latency manager for

2   the time taken to complete the memory access; the latency manger being part of

3   managing the memory system.

1   9.   The method of claim 6 further comprising the steps of:

2   using a memory table having entries pointing to data blocks storing data

3   for at least one subsystem; and

4   using the entries to locate the access data.

1   10.   The method of claim 9 wherein the memory table working with a memory

2   manager managing the data blocks independent of a processor working with the

3   memory system and independent of an operating system working with the memory

4   system.

1   11.   A method for managing a memory system, comprising the steps of:

2   upon accessing the memory system for a piece of data used by a first

3   process

4   counting a time elapsed from the time the data access starts; the

5   counted time being increased as the data is being accessed;

6   comparing the counted time to a threshold; and

7   if the counted time is close to, equal to, or greater than the

8   threshold, then taking an action selected in one or a combination of

9   postponing executing the first process and allowing

10   executing a second process;

11   causing the first process to be switched to a second process;

12   and

13   causing a performance monitor on the memory system or on

14   a system using the memory system.

1   12.   The method of claim 11 further comprising the steps of:

2   using a memory table having entries pointing to data blocks storing data

3   for at least one memory subsystem; and

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4   using the entries to locate the access data.

1   13.   A computer-readable medium embodying instructions for a computer to perform a

2   method for managing a memory system having a plurality of subsystems, the

3   method comprising the steps of:

4   upon accessing the subsystems for a piece of data used by a first process,

5   determining the access time to acquire the piece of data in the

6   memory system;

7   comparing the determined access time to a threshold; and

8   taking an action based on the results of the comparing step;

9   wherein accessing the subsystems is in a non-sequential order.

1   14.   The computer-readable medium of claim 13 wherein data blocks containing the

2   piece of data is placed in the memory system based on information selected in one

3   or a combination of:

4   a movement pattern of data in a data block,

5   a structure of the memory system, and

6   a cache-level architecture in the memory system.

1   15.   The computer-readable medium of claim 13 wherein the method further

2   comprising the steps of:

3   using a memory table having entries pointing to data blocks storing data

4   for at least one subsystem; and

5   using the entries to locate the access data.

1   16.   The computer-readable medium of claim 15 wherein the memory table working

2   with a memory manager managing the data blocks independent of an operating

3   system working with the memory system and independent of a processor working

4   with the memory system.

1   17.   The computer-readable medium of claim 13 wherein the method further comprises

2   the steps of:

3   using a memory table having entries pointing to data blocks storing data

4   for the memory system; and

5   the memory table using a physical address of a memory page

6   corresponding to the piece of access data to convert to a location

7   address corresponding to an entry pointing to the location of the

8   piece of access data.

1   18.   A computer-readable medium embodying instructions for a computer to perform a

2   method for managing a memory system, the method comprising the steps of:

3   upon accessing the memory system for a piece of data used by a first

4   process,

5   a processor working with the memory system continuing its

6   functions until it is stalled;

7   comparing the time taken to complete the memory access to a

8   threshold; and

9   if the time taken to complete the memory access is close to, equal

10   to, or greater than the threshold, then taking an action.

1   19.   The computer-readable medium of claim 18 wherein the method further comprises

2   the step of polling a latency manager for the time taken to complete the memory

3   access; the latency manger being part of managing the memory system.

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1   20.   The computer-readable medium of claim 18 wherein the method further comprises

2   the steps of:

3   using a memory table having entries pointing to data blocks storing data

4   for at least one subsystem; and

5   using the entries to locate the access data.

1   21.   A computer-readable medium embodying instructions for a computer to perform a

2   method for managing a memory system, the method comprising the steps of:

3   upon accessing the memory system for a piece of data used by a first

4   process,

5   counting a time elapsed from the time the data access starts; the

6   counted time being increased as the data is being accessed;

7   comparing the counted time to a threshold, and

8   if the counted time is close to, equal to, or greater than the

9   threshold, then taking an action selected in one or a combination of

10   postponing executing the first process and allowing

11   executing a second process;

12   causing the first process to be switched to a second process;

13   and

14   causing a performance monitor on the memory system or on

15   a system using the memory subsystem.

1   22.   The computer-readable medium of claim 21 wherein the method further comprises

2   the steps of:

3   using a memory table having entries pointing to data blocks storing data

4   for at least one memory subsystem; and

5   using the entries to locate the access data.

1 23. An apparatus for managing a memory system having a plurality of subsystems,

2   comprising:

3   means for, upon accessing the subsystems for a piece of data used by a first

4   process,

5   determining the access time to acquire the piece of data in the

6   memory system;

7   comparing the determined access time to a threshold; and

8   taking an action based on the results of the comparing step;

9   wherein accessing the subsystems is in a non-sequential order.

1 24. The apparatus of claim 23 wherein data blocks containing the piece of data is

2   placed in the memory system based on information selected in one or a

3   combination of:

4   a movement pattern of data in a data block,

5   a structure of the memory system, and

6   a cache-level architecture in the memory system.

1 25. The apparatus of claim 23 further comprising a memory table having entries

2   pointing to data blocks storing data for at least one subsystem; the entries being

3   used to locate the access data.

1 26. The apparatus of claim 25 wherein the memory table working with a memory

2   manager managing the data blocks independent of an operating system working

3   with the memory system and independent of a processor working with the memory

4   system.

1 27. The apparatus of claim 23 further comprising a memory table having entries

2   pointing to data blocks storing data for the memory system; the memory table

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3   using a physical address of a memory page corresponding to the piece of access

4   data to convert to a location address corresponding to an entry pointing to the

5   location of the piece of access data.

1 28. An apparatus for managing a memory system, comprising:

2   upon accessing the memory system for a piece of data used by a first

3   process,

4   a processor for working with the memory system and for continuing

5   its functions until it is stalled;

6   means for comparing the time taken to complete the memory access

7   to a threshold; and

8   means for taking an action if the time taken to complete the

9   memory access is close to, equal to, or greater than the

10   threshold.

1 29. The apparatus of claim 28 further comprising means for polling a latency manager

2   for the time taken to complete the memory access; the latency manger being part

3   of managing the memory system.

1 30. The apparatus of claim 28 further comprising a memory table having entries

2   pointing to data blocks storing data for at least one subsystem; the entries being

3   used to locate the access data.

1 31. An apparatus for managing a memory system, comprising:

2   upon accessing the memory system for a piece of data used by a first

3   process,

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4 means for counting a time elapsed from the time the data access

5   starts; the counted time being increased as the data is being

6   accessed;

7 means for comparing the counted time to a threshold, and

8 if the counted time is close to, equal to, or greater than the

9 threshold, means for taking an action selected in one or a

10 combination of

11   postponing executing the first process and allowing

12   executing a second process;

13   causing the first process to be switched to a second process;

14   and

15   causing a performance monitor on the memory system or on

16   a system using the memory subsystem.

1 32. The apparatus of claim 31 further comprising a memory table having entries

2 pointing to data blocks storing data for at least one memory subsystem; the entries

3 being used to locate the access data.

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